CASPIAN TERN RELOCATION PILOT STUDY
LOWER COLUMBIA RIVER
CLATSOP COUNTY, OREGON

FINDING OF NO SIGNIFICANT IMPACT

The proposed action is to relocate most of the Caspian tern colony presently nesting at Rice Island, rivermile (RM) 21-22 of the Columbia River, to East Sand Island, near RM 5 of the Columbia River. This site was used by nesting Caspian terns from 1984-1986. The Caspian Tern Working Group developed the proposed action as a pilot study to determine if the tern colony can be moved, and if relocation of the colony will reduce predation on outmigrating salmonid smolts. To accomplish relocation, the following activities, revised from the draft environmental assessment to respond to reviewers' concerns, are proposed:

1. Vegetate Miller Sands Spit, Pillar Rock Island (recent disposal site previously coordinated with resource agencies and covered under other environmental documents) and Rice Island (except 1 acre reserved for Caspian tern nesting as a control site for monitoring effectiveness of the study). The location of the 1-acre nesting area for Caspian terns on Rice Island will be determined through consultation with OSU/CRITFC researchers. The location will be within the existing colony location.

2. Develop approximately 16 acres of Caspian tern nesting habitat at East Sand Island near Chinook, Washington using existing substrate materials present on the island. Decoys and a sound system will be used to attract Caspian terns to the constructed habitat. Research and monitoring of the relocated Caspian tern colony will be conducted to evaluate the action.

3. If necessary, initiate human disturbance of Caspian terns at Rice Island and Miller Sands Spit prior to nesting by Caspian terns. This action will be consistent with the Migratory Bird Treaty Act. In-season management of this activity will be implemented in coordination with the Caspian Tern Working Group.

4. An extensive research and monitoring effort will be employed to evaluate Caspian tern nesting activities at Rice Island, Miller Sands Spit and East Sand Island. In consultation with the Caspian Tern Working Group, all actions can be reversed should the monitoring efforts find unexpected results.

5. Selective, lethal removal of problem (predatory) gulls or mammalian predators will be employed at Rice Island and East Sand Island to provide the best habitat practicable for Caspian tern colony establishment at East Sand Island and to retain a 1-acre colony area at Rice Island.

The following mitigation actions will be implemented:

1. In-season management of the efforts implemented under the Caspian Tern Pilot Relocation Study will be coordinated with the Caspian Tern Working Group. There will be meetings of the Working Group open to non-Governmental conservation organizations and other interested parties.

2. The Washington Department of Fish and Wildlife and National Marine Fisheries Service will continue coordination with Sea Resources at Chinook, Washington to minimize impacts to, and improve, their hatchery program.

3. Pilot study activities would be implemented in a manner to limit impacts to double-crested cormorants and other migratory birds, to the extent practicable.

The U.S. Army Corps of Engineers prepared a biological assessment and has initiated consultation under Section 7(a) (2) of the Endangered Species Act. While a biological opinion is being prepared, the Corps has made a 7(d) determination that activities to begin vegetating the islands and to start work on the habitat creation at East Sand Island will not foreclose any reasonable and prudent measure that may be recommended by the National Marine Fisheries Service.

I have reviewed the Environmental Assessment and determined that the proposed action would not significantly affect the quality of the human environment and that an Environmental Impact Statement is not required.

Date: 1/15/99

ROBERT T. SLUSAR
Colonel, EN
Commanding

CASPIAN TERN RELOCATION PILOT STUDY
LOWER COLUMBIA RIVER
CLATSOP COUNTY, OREGON

ENVIRONMENTAL ASSESSMENT

INTRODUCTION

Caspian tern breeding was first documented in the Columbia River estuary in 1984 when about 1,10 pairs were reported nesting on fresh dredged material on East Sand Island. Prior to 1984, the species was a non-breeding summer resident of the lower Columbia River. In 1986, probably because of vegetation development on East Sand Island, most of the colony moved to Rice Island, an island created from dredged material disposal in 1962 and having broad sandy areas due to continued disposal.

Because of concerns regarding avian (bird) predation on outmigrating juvenile salmonids, the March 2, 1995 National Marine Fisheries Service (NMFS) Biological Opinion on Operation of the Federal Columbia River Power System (1995 Biological Opinion) included as Incidental Take Provision #9 the requirement that the US Army, Corps of Engineers (Corps) “conduct studies to identify (a) Caspian Tern predation of juvenile salmonids, and (b) methods to discourage tern nesting.”

In response to the 1995 Biological Opinion, research on Caspian tern foraging ecology began in 1996, conducted by Oregon State University (OSU) and Columbia River Inter-Tribal Fish Commission (CRITFC). Preliminary research results indicated the colony has grown rapidly (in 1997 the colony size was estimated to be about 8,000 pairs, and in 1998 the estimate was 10,000 pairs) and consumed large amounts of salmonid smolts (6 to 25 million over the 1997 nesting period). Consequently, NMFS has requested immediate remedial action to lessen impacts to salmonids. A multi-agency working group, the Caspian Tern Working Group or Avian Predation Working Group) was formed in May 1998 to develop a short-term plan for reducing salmon predation by Caspian terns nesting at Rice Island to be implemented before the 1999 juvenile salmonid out-migration. A system-wide, long-term plan to reduce predation by piscivorous (fish-eating) birds (terns, cormorants and gulls) on juvenile salmonids may also be necessary in the future. Data from the short-term plan to reduce avian (bird) predation will be considered in developing any long-term plan. Much of the data presented in this document is from the 1997 Annual Report, Avian Predation on Juvenile Salmonids in the Lower Columbia River (Roby et al., 1998) and from preliminary data from 1988 research efforts by OSU/CRITFC.

NEED FOR ACTION

Of 18 evolutionarily significant units (ESU) of naturally produced anadromous salmonids in the Columbia Basin, two are listed as endangered, five are listed as threatened, six are proposed to be listed within the year and one is under review. Only four ESUs have been determined as unwarranted for listing. Two of these four ESUs, the Wenatchee and Okanogan sockeye salmon represent rapidly declining stocks.

Preliminary results of OSU-CRITFC research indicate that the nesting colony of Caspian terns located at Rice Island in the Columbia River consumed 6 to 25 million salmonid smolts in 1997. This represents about 6 to 25 percent of the 100 million out-migrating smolts that reached the estuary, or 3 to 12 percent of the 200 to 250 million smolts produced basinwide. The peak migration period of juvenile salmonids coincides with the nesting and rearing season of the terns. Additionally, Rice Island is located near the furthest upstream intrusion of salt water into the estuary. Smolts may delay before entering salt water or may move into the fresh water lens that “floats” on the more dense saltwater. Estimates in 1997 and 1998 are that the tern colony consisted of 8,000 and 10,000 pairs of birds, respectively. Resource agencies, including the NMFS, are concerned that this level of predation is injurious to species and stocks of salmonids listed under the Endangered Species Act. NMFS estimates that 250,000 fish of listed stocks were taken in 1997 by Caspian terns using the average number of juvenile salmonids taken by terns for that year. Further, NMFS estimates that 1,600,000 listed fish could be taken in 1999 by Caspian terns; this reflects in part a greater number of listed stocks in 1999 for the Columbia River basin (Herb Pollard, NMFS, pers. comm.). Certain listed stocks have been incorporated into the hatchery program to facilitate Columbia River salmonid recovery efforts. some Upper Columbia River steelhead, nearly all Snake River sockeye, many Snake River spring-summer chinook and some Snake River fall chinook originate from hatcheries. The hatchery component as well as the wild stocks are ESA listed. Some lower Columbia River summer and winter steelhead (Kalama, Sandy and Clackamas River) originate from hatcheries and are ESA listed. Cowlitz River reintroductions of winter steelhead and spring chinook are ESA listed. Hatchery chums (Grays and Elochoman River) are also ESA proposed stocks. Hatchery fish remain an important component of Columbia River salmonid recovery efforts.

Junge (1967) provides an argument that ocean survival is not density dependent and concludes “... that a reduction of smolts by a fraction *m* will on the average reduce the production of returning adults also by a fraction *m*.” While there is considerable debate about the effects of ocean conditions, and some more recent reviews attach some qualifiers to Junge’s conclusion (Emmett and Schiewe, 1997), it is a central assumption behind most of the multi-million dollar Columbia Basin fish

mitigation activities: If more live smolts can be delivered to the ocean, more adults will return. For example, the whole point of collecting and transporting smolts around the dams is to get more live smolts to the ocean. The goal of the northern pikeminnow control project is to get more live smolts through the system. In 1997, only 11.8 million smolts were collected and transported. The northern pikeminnow (formerly squawfish) control program is estimated to reduce predation on juvenile salmonids by 3 to 5 million annually. Smolt consumption estimated for the single tern colony on Rice Island is 6 to 25 million smolts. There is now very credible information that many smolts are lost to avian predation in the estuary after being safely passed through the FCRPS by ongoing mitigation programs.

It is therefore expected that restoration of the tern colony on East Sand Island, closer to the mouth of the river, would expand the diversity of prey species available for terns, reducing predation on salmonids. East Sand Island lies at the mouth of the Columbia River, near marine waters where more fish species and total numbers of fish occur than at Rice Island (Bottom and Jones, 1990). Based on OSU-CRITFC research, double-crested cormorants nesting on East Sand Island are much less reliant on juvenile salmonids as a food source than cormorants nesting on Rice Island. Also, stomach contents of terns returning to the Rice Island colony from downriver (direction of East Sand Island) included a significantly lower proportion of juvenile salmonids than those of terns returning to the colony from upriver. Thus, shifting the tern colony to East Sand Island could lessen their dependence on outmigrating juvenile salmonids as a food source.

PROPOSED ACTION and ALTERNATIVES

It is proposed to relocate most of the Caspian tern colony presently nesting at Rice Island, rivermile (RM) 21-22 of the Columbia River, to East Sand Island, near RM 5 of the Columbia River. (Figure 1) This site was used by nesting Caspian terns from 1984-1986. The Caspian Tern Working Group developed the proposed action as a pilot study to determine if the tern colony can be moved, and if relocation of the colony will reduce predation on outmigrating salmonid smolts. Elements of the proposed action are displayed in matrix form in Table 1.

Figure 1. VICINITY MAP

(Click on this page to view map)

Table 1- Action Matrix

Proposed Action	Rice Island	Miller Sands Spit	East Sand Island
East Sand Island Scarification and Use of Decoys/Recorded Calls.	Not Applicable	Not Applicable	Objective: Establish Caspian Tern Colony. Action: Scarify 16 acres at u/s tip of island to provide suitable nesting habitat for Caspian terns; lure them to site. Implementation of scarification in winter; decoys/recorded calls begin late March. Management of problem gulls occurs spring.
Rice Island and Miller Sands Spit Vegetation Establishment	Implemented prior to tern arrival. Objective: Preclude tern nesting. Action: Establish vegetative cover on ~ 199 acres; action reversible with minimal tillage. 1 acre of 8-acre colony site left unseeded.	Implemented prior to tern arrival. Objective: Preclude tern nesting. Action: Establish vegetative cover on ~ 100 acres; action reversible with minimal tillage.	Not Applicable
Rice Island and Miller Sands Spit Human Disturbance	Probable timeframe April 5-May 5, or until onset of nesting. Objective: Preclude tern nesting. Action: Employ human disturbance at tern congregation locations. Intervention is very site specific and does not intrude upon majority of island thus negligible impacts to other species. Will disrupt terns, cormorants and gulls at colony locations at Rice Island. Measure essential to accomplish tern relocation.	Probable timeframe April 5-May 5, or until onset of nesting. Objective: Preclude tern nesting. Action: Employ human disturbance at tern congregation locations. Intervention is very site specific and does not intrude upon majority of island thus negligible impacts to other species. Will disrupt terns and potentially nesting gulls on Miller Sands Spit. Action necessary to preclude relocation of terns to Spit.	Not Applicable

To accomplish relocation, habitat development at East Sand Island would entail removal of vegetative material and debris from approximately 16 acres at the upstream tip of the island.(Figure 2) The objective is to create a bare sand environment suitable for nesting Caspian terns. Scarification to an estimated soil depth of 1 foot would be accomplished through use of grading equipment. Sand from adjacent areas would be spread over the scarified site to obtain maximum practicable burial of seeds, roots and silt, and to build up surface elevation. Scarified vegetation and debris would be mounded in two or three discrete piles, buried in linear trenches, burned and/or allowed to float off with the tide. Decoys and a sound system to play back recordings of Caspian tern colony calls would be placed at the constructed nesting site to attract terns.

Figure 2. EAST SAND ISLAND SCARIFICATION
CASPIAN TERN RELOCATION PILOT STUDY

(Click on this page to view map)

To discourage nesting at upriver sites, seeding a total of approximately 300 acres (199 acres at Rice Island and 100 acres at adjacent Miller Sands Spit) to establish vegetative cover not conducive to tern nesting is also planned. Of the 8-acre tern colony site on Rice Island, 7 acres would be vegetated and 1 acre left as open sand. In addition, 10 acres of dredged material recently disposed at Pillar Rock disposal site (RM 27) would be vegetated. Vegetation of this island has been previously coordinated with resource agencies as part of ongoing disposal site management efforts. Previous environmental assessments address vegetation of this island for goose forage. Vegetation establishment, implemented as a part of the Corps dredged material disposal activities, represents compliance with proposed terms and conditions per Endangered Species Act coordination. Planting of winter wheat during the 1998/99 winter season would result in sufficient growth to allow successful planting of mixed pasture grasses in March 1999. Without the earlier protection of the wheat, the grass seedlings are subject to wind erosion leading to exposure of their roots, thereby killing the plants.

Human disturbance to discourage nesting is proposed at Rice Island and Miller Sands Spit if Caspian terns return to Rice Island or Miller Sands. Caspian terns flock together when they arrive in the estuary. These flocks may occur on beaches, sand flats, upland areas, etc. which provide them open space. Those aggregations occurring at Miller Sands Spit and/or Rice Island, irrespective of their specific location, would be disturbed, if necessary, as a means to discourage the birds from frequenting the area and to give them an impetus to move downstream to East Sand Island. If too many terns congregate on the 1-acre unseeded site, they will also be disturbed, as will those nearby on the beaches. Caspian terns would be discouraged from nesting only prior to nest initiation. All disturbance actions would cease with initiation of egg laying. This action will be consistent with the Migratory Bird Treaty Act (MBTA).

In-season management of the human disturbance activity will be implemented in coordination with the Caspian Tern Working Group. This activity would target the existing colony location and day/night roost locations. Such locations are specific and discrete, thus any disturbance would be localized and of short duration sufficient to disturb the birds at that site. Aggregations of terns on Miller Sands Spit (more than 50 birds), would initiate human disturbance there. The areas frequented by terns are site specific and entail only small portions of the total area available at either Rice Island or Miller Sands Spit. Disturbance would not be broadly applied over the entire islands. Human disturbance would entail the use of personnel without dogs, intruding on those specific locations where terns are congregating to roost, nest or loaf. Selective removal of problem gulls could also occur if predatory gulls interfere with tern nesting on the 1 acre left unseeded. Removal of other predators, such as raccoons, would also occur as necessary.

If nesting does occur at East Sand Island and is disrupted by gulls, which also nest at that island, selective removal of problem gulls and mammalian predators may be necessary. Mammalian predators are not now present on East Sand Island, thus its use by colonial nesting birds. Glaucous-winged/western gull hybrids nesting at a colony adjacent to the Caspian tern colony were observed by OSU/CRITFC researchers to steal fish from terns, rob eggs from nests and prey upon young terns. They observed that gull intervention and predation led to the failure of the tern colonization effort at Miller Sands Spit in 1998. The selective removal of disruptive gulls is intended to preclude other gulls from learning this behavior and therefore enhance the likelihood that the tern colony can successfully use East Sand Island. Gull removal is estimated at upwards to 200 birds.

Intensive monitoring and evaluation of Caspian tern nesting success and consumption of salmonids would occur through an on-going research effort conducted by OSU-CRITFC.

Habitat modification at East Sand Island, Rice Island and Miller Sands Spit would be accomplished by the Corps. Placement of decoys and sound devices and their implementation would be done by researchers associated with OSU-CRITFC. Discouragement of nesting at Rice Island and Miller Sands Spit and gull/predator management at East Sand Island and Rice Island would be performed by others and OSU-CRITFC researchers. The USFWS would provide assistance regarding Migratory Bird Treaty Act issues. The proposed action and/or research efforts are also partially funded by NMFS and the Bonneville Power Administration (BPA).

In addition to the acreage modification described above, mitigation measures are now included in the proposed action. These include: (1) In-season management of the efforts implemented under the Caspian Tern Pilot Relocation Study will be coordinated with the Caspian Tern Working Group. There will be meetings of the Working Group open to non-Governmental conservation organizations and other interested parties; (2) The Washington Department of Fish and Wildlife and National Marine Fisheries Service will continue coordination with Sea Resources at Chinook, Washington to minimize impacts to, and improve, their hatchery program; and (3) Pilot study activities would be implemented in a manner to limit impacts to double-crested cormorants and other migratory birds, to the extent practicable. The alternative to the proposed action is no action. The action as proposed would undertake habitat management as the initial step (i.e., re-creating preferred nesting habitat at East Sand Island; vegetating Rice Island and Miller Sands Spit). However, if significant concentrations of terns develop at Rice Island and Miller Sands Spit, then it is believed that disturbance would be necessary to effect the relocation. Results of tern foraging ecology studies for birds nesting at East Sand Island would be

most meaningful if a substantial portion of the existing tern colony successfully relocates and nests there.

Predation by Caspian terns at Rice Island is believed by NMFS to be so detrimental to the listed salmonids that no action or a further delay in implementation of the pilot study would adversely affect recovery of salmonid stocks listed under the Endangered Species Act of 1973, as amended. NMFS estimates that 250,000 fish of listed stocks were taken in 1997 by Caspian tern using the average number of juvenile salmonids taken by terns for that year. Further, NMFS estimates that 1,600,000 listed fish could be taken in 1999 by Caspian terns; this reflects in part a possible greater number of listed stocks in 1999 for the Columbia River Basin.

AFFECTED ENVIRONMENT

Columbia River Estuary. The Columbia River estuary is 4 to 5 miles wide and extends upriver to around RM 38. There are two main channels, the north and south channels. The south channel is an extension of the main river channel upstream of the estuary and carries most of the river flow. This is also the main navigation channel, which is dredged annually by the Corps to maintain the presently authorized 40-foot-deep, 600-foot-wide navigation project. The north channel extends to about RM 20, near the downstream end of Rice Island. Wide, shallow intertidal and subtidal flats separate these two deep channels. Hydrology of the estuary is affected by downstream flows, which are to some extent regulated by the upriver system of dams, and ocean tides. Tidal influence extends upstream to Bonneville Dam, at RM 143. The salt wedge, however, penetrates upstream to about RM 23.

Islands in the estuary are typically intertidal in nature and most occur in Cathlamet Bay. Exceptions are East and West Sand Island in Baker Bay, Rice, Miller Sands Island and Spit and Pillar Rock (Jim Crow Sands) on the northern edge of Cathlamet Bay, and Puget and Tenasillahe Islands. Rice, Miller Sands Island and Spit, and Pillar Rock were artificially created from sandy material dredged from the Columbia River navigation channel. The Columbia River, estuary and Pacific Ocean provide habitat for a variety of aquatic flora and fauna. Plants range from phytoplankton to marsh ecosystems. Animal life ranges from zooplankton to mammals. Of significance to this Environmental Assessment (EA) are the fish species fed upon by birds for which adaptive management is proposed.

Fish. Estuarine habitats support a variety of anadromous and resident fish species. Anadromous fish are present in the river almost year-round, either as adults migrating upstream to spawn, or as juveniles, migrating downstream to the ocean or rearing in the estuary (fall chinook). Anadromous species include the following salmonids: spring, summer and fall run chinook; coho; sockeye; chum salmon; winter and summer run steelhead; and searun

cutthroat trout. Other anadromous species include green and white sturgeon, Columbia River smelt, American shad and lamprey. Resident species remain in the river and estuary throughout their life cycles. Some resident species are northern pikeminnow, common carp, small and largemouth bass, yellow perch, peamouth, large-scale sucker and white crappie.

Marine fish occur in the ocean and the estuary. Dominant marine fish in the estuary include northern anchovy, Pacific herring, Pacific staghorn sculpin, starry flounder, longfin smelt, surf smelt, whitebait smelt, Pacific tomcod, English sole, various species of surf perches, shiner perch, rockfish species, and sanddabs.

Run size of salmon in the river has been decreasing since the turn of the century. Further declines in wild salmon numbers in the early 1990's prompted the NMFS to list or propose for listing several Columbia Basin salmonids. Estimates of numbers of smolts reaching the estuary in 1997, and return run size of salmon into the Columbia River for 1993-96 is shown below in Tables 2 and 3, respectively. The majority of the out-migrating smolts, and many of the returning adult salmonids, are hatchery fish which are produced to support important tribal, recreational and commercial fisheries, to mitigate for fish and habitat lost to the Federal Columbia River Power System (dams), and to restore threatened and endangered species. The majority of the remaining stocks of wild fish are ESA listed species. The exact proportion of wild to hatchery fish is not specifically known; however, many wild stocks have been incorporated into the hatchery program.

Wildlife. There is a great diversity of wildlife in and around the estuary. These include marine mammals, fur bearers, deer, numerous small mammals (including rodents), reptiles and amphibians. However, it is primarily birds that occur in the area which would be affected by the proposed action. Three species of loons occur as spring and fall migrants and have been observed in the estuary during the winter. Grebes occur in the estuary particularly in bays, during migration and in winter. Brown pelicans typically occur from mid-spring to late fall along the coast, with concentrations of up to 1,000 birds at the mouth of the Columbia at South Jetty and East Sand Island-Baker Bay (Briggs et al. 1992 IN Corps 1998).

Table 2- Estimated Total Anadromous Salmonid Smolts Arriving below Bonneville Dam, 1997

Arrival time:	4/15-5/15	5/15-6/15	6/15-7/15	7/15-8/15	Totals
Chinook Yearling	7,239,532	2,875,699	---	---	10,115,230
Chinook	5,037,755		24,787,383	17,916,201	64,070,625

Subyearling		16,329,286			
Winter Steelhead	550,532	164,670	---	---	715,202
Hatchery Steelhead	8,644,012	3,122,486	---	---	11,766,499
Coho	6,319,603	6,344,496	490,455	---	13,154,555
Wild Sockeye	20,913	94,006	91,935	22,984	229,838
Hatchery Sockeye	2,108	9,547	9,323	2,331	23,309
Totals	27,814,455	28,940,190	25,379,097	17,941,516	100,075,258

Source: Provided by NMFS; compiled from a variety of documents.

Table 3 - Minimum Numbers (in Thousands) of Salmon and Steelhead, Including Jacks Entering the Columbia River, 1993-96.[1,2]

	Chinook			Sockeye	Coho	Chum	Steelhead		
Year	Spring	Summer	Fall				Winter	Summer	Total
1993	205.4	23.6	235.6	84.2	118.2	4.5	36.4	242.8	988.7
1994	83.1	19.5	295.4	12.7	179.5	1.2	(58.2)	211.9	861.5
1995	64.4	17.1	300.1	9.2	89.4	1.5	(20.8)	(248.2)	750.7
1996	100.6	18.0	352.7	30.3	127.5	3.3	33.7	237.1	902.9

[1/] From Norman and King, 1996. 1996 data provided by NMFS

[2/] Numbers in parentheses indicate incomplete data.

Double-crested, pelagic and Brandt's cormorants occur in the estuary and forage in estuary waters. Double-crested cormorants are the most numerous and occur year-round. East Sand Island and Rice Island support large nesting colonies of double-crested cormorants. Nine gull species commonly occur off the Oregon coast, and three others are known to occur. Gull colonies are located on East Sand Island, Rice Island and Miller Sands Spit and consist of glaucous-winged/western gull hybrids. Ring-billed gulls also nest on the Spit. Three species of tern occur in the river or nearshore areas. Common and Arctic terns occur off the coast from April to September, principally as migrants. Caspian terns are present from April to September and occupy a large breeding colony on 8 acres of the western end of Rice Island. The Caspian tern nesting population has grown from about 1,000 pairs in 1984 (on East Sand Island) to an estimated 10,000 pairs on Rice Island in 1998. Much of this increase appears to have occurred from colonies at other locations shifting to the Columbia River estuary, apparently due to habitat loss elsewhere. This colony currently represents the largest known Caspian tern

colony in North America. Relocation en masse is typical of tern colonies.

Waterfowl are seasonally abundant. Agricultural lands along the river and intertidal marshes in the estuary provide substantial habitat along the lower river. Mallards, northern pintails, American wigeon, green-winged teal, Canada geese, and scaup are the most abundant wintering species. Mallards and Canada geese are the principal nesting species. Islands, particularly dredged material islands, are important nesting sites for the resident populations of Canada geese and mallards. Substantial numbers of wintering Canada geese use these islands.

Raptors (hawks, owls) occur both as residents and/or wintering birds. Bald eagles are relatively abundant. Peregrine falcons are also present, as are several species of hawks and owls.

Many other nongame bird species occur throughout the estuary. Shorebirds are abundant during spring and fall migration with substantial numbers overwintering in the estuary. Large concentrations of shorebirds use high tide roosts at the downstream tips of Rice Island and Miller Sands Spit. While riparian habitat is important to many of these nongame bird species, some prefer grassy uplands and dredged material disposal sites. Savannah and white-crowned sparrows and horned larks inhabit dredged disposal sites where the open, sparsely vegetated terrain provides preferred nesting and foraging habitat.

Human Population. Except for the Cities of Astoria, Warrenton, Hammond, Chinook and Ilwaco, human population along the estuary is sparse. Astoria is the largest population center and sustains the only deep draft port below RM 68. Clatsop County, Oregon, and Wahkiakum and Pacific County, Washington, all have relatively small populations and resource based manufacturing sectors. Forest and farmlands dominate the estuary and lower river. Fishing, and fish related industry, still have local interest and is the primary economic base of some smaller communities such as Ilwaco and Chinook, Washington, and Warrenton, Oregon. One organization, Sea Resources in Chinook, Washington, maintains a salmon hatchery at RM 4 of the Chinook River. Sea Resources is a community non-profit organization that is presently involved in watershed restoration. The hatchery is a tool to restore fish runs as part of a healthy watershed. About a million chinook, chum and coho are raised and released from the hatchery.

There are several terminal fishery rearing pens in the estuary. These are in Young’s Bay, at several tributaries to the Columbia River, Tongue Point (Oregon), and Grays Bay/Deep River (Washington). Salmon are released as juveniles and then the adults are harvested near the release spot. The Youngs Bay terminal fisheries were established as part of a Clatsop County

Economic Development Council program. These and other estuary terminal fishery efforts have ODFW and BPA involvement.

East Sand Island. Sand Island, located near RM 5 of the Columbia River, was withdrawn from the public domain for military use in 1863, was utilized as a military observation post during World War II, and reassigned to the Corps in 1954. Over the years, accretion (some from dredged material disposal) and erosion have changed the size and shape of the island and caused it to shift in location north of its original position. Presently, the island mass is separated by a channel into West Sand Island and East Sand Island. The entire island mass remains within the State of Oregon, the State boundary following the channel separating the islands from Chinook and Ilwaco, Washington. (The islands remain in Oregon because of their origins on the south side of the historic Columbia River channel.) West Sand Island is occasionally used as a disposal area for maintenance dredging of material from Baker Bay West Channel. Chinook Channel material, containing silts, has gone to East Sand Island, most recently in 1983. Pile dikes were built along the island beaches to control erosion and control the river at both islands. During the 1970's, West Sand Island was leased for cattle grazing, but this activity has not occurred since 1975. The only access to the islands is by boat. Minimal recreational activity occurs on these islands, principally camping and waterfowl hunting. The islands are not managed for any activity other than dredged material disposal. East Sand Island is presently about 6,000 feet long by 100 to 500 feet wide and contains about 53 acres of grass-covered sandy and silty soil. Dredged material has been disposed on the eastern end and southern side several times, the most recent in 1983. The disposal location, a diked upland site, has developed wetlands on a portion of the area. Tidal marsh flats are present along the bay side of the island. The eastern end of the island is covered with herbaceous vegetation, primarily European beach grass and some American dune grass. Coast willow and red alder are also present. Woody debris left by high river flows and tides occurs at the high tide line. Central and western portions of the East Sand Island have remnants of WW II era railroad and concrete "pill boxes." Any remaining cultural resources on the east end have been covered by dredge spoils.

Approximately 7,000 pairs of gulls nest throughout East Sand Island, with about 300 pairs occurring in the project area. Cormorants nest on the downstream one-half of the island. This colony, estimated to be over 5,000 pairs in 1997, is the largest breeding colony of cormorants on the west coast of North America. The western half of East Sand Island constitutes the second largest brown pelican roost site in the Pacific Northwest. USFWS recorded 1,200 pelicans here in 1998. Canada geese and mallard ducks nest to a limited extent in the project area. Nesting by Caspian terns in the Columbia River estuary was first observed in 1984 when approximately 1,100 pairs nested at East Sand Island. The 1984 colony location was within the diked disposal area used

in 1983 for dredged material placement, approximately 350 feet northwest of the pipeline outfall location. The colony location in 1985 was still within the diked disposal area, north of the 1984 location and west of the outfall location. The 1986 colony location at East Sand Island was outside the diked disposal area, in a low-lying area just above the beach and amongst the driftwood. Approximately 1,000 terns were reported nesting on Rice Island in 1986 and the entire colony has located at Rice Island thereafter. Vegetation by local species within the diked disposal area apparently led to shifts in the colony location at East Sand Island and ultimately to the colony's shift to Rice Island.

Preferred nesting habitat in Washington State apparently also was reduced in the 1980s' and 1990's and probably contributed to the shift in tern nesting location and the increase in size of the tern colony in the Columbia River estuary.

Rice Island. Rice Island, located at RM 21-22 of the Columbia River north of the main navigation channel, is one of a series of dredged material disposal islands created by the Corps upstream of Astoria. Continued use of Rice Island as a disposal site is a significant component in maintaining the navigation channel. Management of dredged material disposal at Rice Island and other nearby disposal sites includes revegetation to reduce wind erosion, provide replacement habitat for Columbia white-tailed deer, and discourage tern nesting. Rice Island is just north and west of Miller Sands Island and Miller Sands Spit, also dredged material disposal islands. Rice Island is about 8,000 feet long by 1,800 feet wide and covers about 230 acres. It consists of sandy material dredged from the Columbia River navigation channel. Dredged material is placed on some portion of the island nearly every year. Grasses have been planted periodically in the past to reduce blowing sand. Planting has been generally unsuccessful at Rice Island, due to wind erosion of sand around seedling roots. The USFWS, Lewis and Clark National Wildlife Refuge, formerly managed Rice Island, until 1994, under a management option with Oregon Division of State Lands (DSL). The USFWS has not renewed its option to manage Rice Island.

The island has remained uncolonized by animals other than voles and birds, principally double-crested cormorants, Caspian terns, glaucous-winged/western gull hybrids, Canada geese, and horned larks and other passerines (perching song birds) that prefer sparsely vegetated habitat. In 1986, a portion of the Caspian tern colony from East Sand Island, about 1,000 adult birds, began nesting at Rice Island. Based on research, including aerial photography, there were about 8,000 pairs of Caspian terns nesting on the island in 1997 and about 10,000 pairs in 1998.

Caspian terns first arrive on the colony in late March to early April. Egg-laying takes place throughout May, with the peak of laying during the second week of May. (However, egg-laying has

been recorded as early as the third week of April at Grays Harbor, Washington.) Young fledge by mid-July. Caspian terns nesting on Rice Island fed entirely on fish, and mostly juvenile salmonids, during the 1997 and 1998 breeding seasons.

Roby et al. (1998) reported that the diet composition (based upon fish dropped, chick regurgitations and adult stomach contents) of terns contained the highest percentage of salmonids (75 percent of identifiable prey items) of those birds that were studied in the estuary. For comparison, the salmonid diet composition for all double-crested cormorants sampled was 24 percent of identifiable prey items, and for gull hybrids nesting in the estuary, 11 percent of identifiable prey items. Cormorants nesting at Rice Island consumed more salmonids (35 percent of identifiable prey items) than cormorants nesting at East Sand Island (16 percent of identifiable prey items; sample size was small). In 1998, cormorants nesting at Rice Island also consumed more salmonids (40 percent of prey items) than cormorants at East Sand Island (9 percent of prey items).

For terns, steelhead smolts were the most prevalent prey type of identifiable prey items (43 percent), followed by coho (31 percent) and chinook (11 percent). Early in the 1997 breeding season, the diet was comprised mostly of coho salmon and steelhead, and by chinook salmon and other species later in the season. The proportion of salmonids in the diet declined as the breeding season progressed, and by July, salmonids no longer composed the majority of biomass consumed. Estimates of consumption by fish species are based on dropped fish (sample size = 119 fish). Foraging distribution of Caspian terns from the Rice Island colony location was investigated in 1998 by OSU-CRITFC researchers through the use of aerial surveys. They determined (unpublished results) that 25 percent of foraging terns were within 2.6 miles of Rice; 50 percent within 4.6 miles or to just downstream of Tongue Point; 75 percent were within 9.2 miles, between rivermile 11 and 30; and 90 percent within 13 miles. The 90 percent ring encompasses East Sand Island at the downstream end to just upstream of Skamokawa (Figure 3). The aerial survey technique used to describe spatial use of the estuary by Caspian terns could not distinguish between commuting and foraging birds, so results are biased, perhaps underestimating foraging range by as much as 30 percent (Ostrand et al., 1998).

Double-crested cormorants have also established a nesting colony on Rice Island, arriving in 1988. There were about 1,200 nesting pairs on Rice Island in 1995 (Carter et al. 1995 IN ODFW 1998). This is the second largest colony on the west coast of North America north of Mexico. Cormorants arrive on the colony in early April and lay eggs from early May to mid-June. Fledging extends through the beginning of August.

Miller Sands Spit. Miller Sands consists of two dredged material disposal sites, Miller Sands Island and Miller Sands Spit. These sites lie within the USFWS', Lewis and Clark National Wildlife Refuge. Miller Sands Island was created in the 1930's and has not been disposed on since that time. The Spit is a 2.5-mile-long curving finger of sand just south of the navigation channel, and about .5 mile north of Miller Sands Island, except where the Spit curves toward the island. It was created in 1975, is actively utilized as a disposal site, and continued use of the site for disposal is important to maintenance of the navigation channel.

Western/glaucous-winged gull hybrids and ring-billed gulls nest on the western tip of the Spit. Canada geese also nest on the Spit, as well as on nearby Miller Sands Island. There is a harbor seal haulout south of the islands. Western grebe, mallard, many other duck species, shorebirds and various species of gulls are abundant in the vicinity, particularly the embayment between the

Figure 3. OBSERVED FORAGING DISTRIBUTION (RICE ISLAND COLONY) AND PROJECTED FORAGING DISTRIBUTION (EAST SAND ISLAND). RINGS INDICATE PERCENT OF OBSERVED/PROJECTED TERN FORAGING EFFORT

(Click on this page to view map)

spit and the island. Nutria are abundant at Miller Sands Island and a few muskrat also inhabit this island. A pair of bald eagles nest on Miller Sands Island; the Spit is part of their home range and foraging territory. The Spit has periodically been planted with grasses following placement of dredged material. Vegetation attempts have been moderately successful on the Spit. Miller Sands Island also has Scot's broom, willow and alder habitat. The Spit was the site of an attempt to relocate some of the Caspian tern colony in 1998. A few pairs tried to nest here, lured by decoys and calls: predatory gulls and crows made nesting unsuccessful.

Threatened and Endangered Species. The US Fish and Wildlife Service (USFWS) has identified several threatened and endangered species as occurring in the general area. These are brown pelican, bald eagle, western snowy plover, peregrine falcon and Oregon silverspot butterfly; and one plant species, Howellia. Brown pelicans occur at and around East Sand Island and are generally present from June to October. Wintering and resident bald eagles are known to forage along the Columbia River, and resident pairs occur in the project vicinity. One pair nests on Miller Sands Island, and previously attempted to nest on Rice Island. Another pair nests on the Washington mainland near East Sand Island. Western snowy plovers formerly occurred on Oregon beaches just south of the Columbia River and a small population is present at Ledbetter Point, Willapa Bay, Washington. Peregrine falcons occur as migrants, wintering and resident birds in and around East Sand, Rice and Miller Sands Spit. Oregon silverspot butterfly requires very specific habitat and is not known to occur in the project area, nor does Howellia.

The NMFS has listed the Snake River spring, summer and fall run chinook salmon as threatened and Snake River sockeye as endangered; Lower Columbia River steelhead and Snake River steelhead as threatened; and the Upper Columbia River steelhead as endangered. Columbia River chum salmon; Lower Columbia River, Upper Columbia River, and Upper Willamette River chinook; and Middle Columbia River steelhead and Upper Willamette River steelhead are proposed for listing as threatened.

No specifically State-listed or sensitive species are known to occur in the project vicinity other than brown pelicans, which are also on the Federal list. Horned larks nest on Rice Island; it has not been established if these are streaked horned lark, an Oregon Natural Heritage Program species of concern in the Willamette Valley. This species' State status is "critical" in the Willamette Valley and Klamath Mountains.

ENVIRONMENTAL EFFECTS

Because the proposed action is a pilot study, some of the impacts are estimated or projected based on preliminary research. Identification of actual impacts (success of colony relocation, dietary changes, loss of gulls, reduction in avian predation on salmon smolts, etc.) is the expected product of the pilot study.

Impacts to Columbia River Estuary. Relocation of the Caspian tern colony from Rice to East Sand Island would affect the fish species that the terns would eat. More species and total numbers of fish are present in the lower estuary. Fish expected to replace salmonids in the tern's diet include American shad, northern anchovy, Pacific herring, Pacific staghorn sculpin, starry flounder, longfin smelt, surf smelt, whitebait smelt, Pacific tomcod, English sole, various species of surf perches and shiner perch. These species are cosmopolitan in nature and serve as the prey source for most fish species in the ocean. As such, they are in high abundance and losses do to predation by the terns would not affect these populations.

Impacts to the Sea Resources' hatchery are not expected to be significant. The hatchery presently plans to begin releasing smolts at night, on an outgoing tide, which would give smolts a "head start" toward the ocean; however, conditions in the Chinook River above the tidegate need improvement for release timing to be most beneficial. While most Sea Resources hatchery releases occur outside of the tern breeding season, some increase in consumption of chinook smolt occur. (See Comment and Response section) Other fish species are available for terns to feed on. The terminal fisheries at Tongue Point and Grays Bay are not expected to be affected. These locations are about equidistant from both East Sand and Rice Islands and predation patterns are not expected to change. Releases from the hatchery at Youngs Bay may be exposed to greater tern predation; however, given the availability of other fish species, this is not expected to be significant.

Impacts to East Sand Island. Grading equipment, to remove vegetation and debris and to expose bare soil of sandy composition, would be used to scarify approximately 16 acres of grass-forb and shrub habitat. Woody debris may be burned, buried or placed on the beach to float off with the tide. Much of the scarified vegetation would be buried. Material not buried would be placed in a manner that will not block tern access or exposure to the beach or open water. Any small mammals (rodents, such as voles) occupying this habitat would probably be lost unless they could move into adjacent habitat (which is generally assumed to be at capacity). This activity would occur in winter after colonial and other nesting birds would have completed nesting activities and brown pelicans have migrated. However, nesting habitat for about 300 pairs of gulls and approximately 12 Canada geese pairs would be destroyed. An internal wetland area would be

avoided. There could be some minor, short-term turbidity as the equipment is loaded off/on a barge. Recorded Caspian tern calls as part of the relocation attempt are not likely to be audible to humans on the mainland. The closest residences, at Chinook, Washington, are about 1 mile distant.

Assuming the construction of a nesting site is successful, large numbers of Caspian terns would begin nesting in this area in April 1999. It is assumed that similar foraging behavior would occur around an East Sand Island colony in 1999 as was observed around the Rice Island colony in 1998. Tern foraging would not be precluded from the area of Rice Island by shifting the colony to East Sand Island, but the majority of their foraging activity would be expected to occur downstream of Tongue Point, with Caspian terns also foraging in offshore waters (Figure 3). While some birds currently forage near East Sand Island from the Rice Island colony, it is assumed there would be a substantial increase in foraging bird numbers around East Sand Island when the colony shifts there. Tern diet composition is expected to shift, and consist of a higher percentage of marine fishes such as herring, anchovy, smelt and perch, with relocation to East Sand Island.

Gulls that exhibit predatory behavior toward the nesting Caspian terns would be removed. If necessary, this would be by lethal means, and these gulls would be lost. Up to 200 gulls may have to be killed to protect tern nesting efforts. This loss constitutes less than 1.5 percent of the gulls (7,000 pairs) presently nesting on East Sand Island. Given the many thousands of gulls in the estuary, this is not expected to be a significant loss. Gulls and Canada geese nesting at the project site are expected to nest elsewhere on the island. No significant impacts to the gull population or the use of East Sand Island as an index site for Canada goose management are foreseen. The cormorant colony is located on the downstream half of the island and is not expected to be affected by activities on the upstream end. In-season management actions would be coordinated with the CTWG to avoid disturbance of cormorants. Brown pelicans also occur on the downstream end of the island. Protective measures requested by USFWS would be implemented to avoid impacts to pelicans. These include signage to preclude human access.

Impacts to Rice Island. If the relocation were successful, Rice Island would have about 1,000 pairs of Caspian terns nesting on the 1-acre of remaining habitat. If human disturbance of terns is necessary, other birds, especially cormorants and gulls, attempting to nest in that area would also be disturbed. In season management of disturbing activities implemented in coordination with the CTWG is expected to avoid significant impacts to cormorants. Efforts to seed portions of Rice Island to make it less attractive to terns would also make it more attractive to resident and wintering Canada geese. A few Canada goose nests may be lost due to measures implemented at the tern

colony location. These losses are not expected to compromise use of Rice Island as an index site for Canada goose management. Planting of vegetation is not expected to deter cormorant and gull nesting at Rice Island. Relocation of the tern colony would reduce available prey for bald eagles in the vicinity of the island. However, relocation en masse is typical of tern colonies and predator species have had to adjust when this occurred. Further, prey resources for bald eagles in the Columbia River estuary are not considered limiting to the population.

If relocation is unsuccessful and terns do not nest successfully due to vegetation, human disturbance and crowding, they may attempt to nest on Miller Sands Spit, or remain in the Rice Island area, consuming fish but not reproducing for the 1999 nesting season. The 1-acre unvegetated sand area on Rice Island would be available for nesting, and some reproductive success is expected there. However, reproductive success could be limited due to crowding and predation by gulls and bald eagles. Low nesting success for one or two seasons is not expected to significantly impact the number of birds comprising the colony. Nesting success was low in 1997, when only about 400 young were successfully raised. An estimated 4,000 terns were fledged in 1998. Birds with long life spans, like the tern, can withstand short-term losses of young, since the adults will produce young in future years. Monitoring and evaluation during the proposed study will document nesting success during the relocation attempt. Provision of alternate nesting habitat at East Sand Island coupled with attraction measures and field research to be conducted on tern nesting and foraging ecology represent measures taken to ensure colony retention and nest success. Information obtained will be used to fine-tune future efforts.

Impacts to Miller Sands Spit. Establishment of vegetation at Miller Sands Spit may discourage Caspian terns attempts to nest there in large numbers, encourage Canada goose use of the island, and reduce wind erosion. Human disturbance at the Spit may also discourage gulls from nesting and could cause abandonment of some Canada goose and early mallard nests. Terns congregate on bare sand, whereas geese and duck nest in vegetative cover. The proposed disturbance efforts are short-term events (minutes in length). Brief disturbance events in bare, sandy habitat would have minimal impact on nesting geese and ducks. The use of Miller Sands Spit as an index site for goose management should not be compromised by proposed activities.

Impacts to Threatened and Endangered Species. The relocation of most of the Caspian tern colony from Rice Island to East Sand Island is expected to reduce tern predation on out-migrating salmonid smolts, a portion of which consists of listed threatened and endangered species. Reduction in avian predation is expected to be of benefit to these listed species, both wild and ESA-stocks from hatcheries. NMFS estimates that about 250,000 fish of listed stocks were taken by Caspian terns in 1997, and expects

this to increase to 1,600,000 in 1999 unless predation is reduced. Relocation of the tern colony is expected to substantially reduce predation of ESA stocks in the estuary.

Relocation of the colony would shift a prey resource from an area used by one or two territorial pairs of bald eagles to the territory of another pair. Prey resources around Rice Island are sufficient for bald eagles without the presence of nesting Caspian terns. Any necessary disturbing activities on Miller Sands Spit would be greater than 3,000 feet from either nest site and visually buffered by cottonwood stands, and should not disturb the eagles at the nest sites. Any nesting attempt by Caspian terns would likely be near the western end or on recently disposed material near the upstream end. Brief disturbance actions at these localized sites are not likely to adversely affect bald eagles nesting at Miller Sands Island or their foraging in the embayment at Miller Sands. Overall, activities associated with this project are not likely to adversely affect bald eagles.

Brown pelicans that loaf on East Sand Island would have migrated before habitat modification occurs. The relocation of a tern colony to the east end of East Sand Island would have no effect on brown pelicans. Research activity at East Sand Island would be more intensive than previous efforts but research activities have to be discrete regardless to minimize potential for disturbance to colonial nesting birds. Thus actions implemented at East Sand Island are not likely to adversely affect brown pelicans. A site visit protocol and signage have been developed in consultation with USFWS to further protect brown pelicans.

Peregrine falcons occur as migrants, wintering and resident birds in the estuary. Habitat modification at East Sand Island, Miller Sands Spit and Rice Island should have no affect on peregrine falcon prey species, principally shorebirds and waterfowl (ducks) that occur in the project vicinity. The resident pair of peregrines is greater than 5 miles distant from any proposed action. Prey resources for this pair are more than adequate near the eyrie. The proposed actions are not likely to adversely affect peregrine falcons.

Western snowy plovers, Oregon silverspot butterfly and Howellia do not occur in the immediate vicinity of any of the islands where project activities are slated. The proposed actions should have no effect on these listed species.

PROJECT COORDINATION

This project has been coordinated with Federal, State and Tribal agencies via the Caspian Tern Working Group (CTWG). This working group, established in May 1998, has met monthly to discuss resolution of this issue. There also has been interagency coordination since the Biological Opinion in 1995 required

research on avian predation of listed salmonids. A draft Environmental Assessment was circulated for 30-day agency and public review on October 29, 1998. The EA also was made available on the Internet. Comments were invited from Federal and State agencies, affected tribes and members of the public. Comments were requested from:

U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
National Marine Fisheries Service
Columbia River Inter-Tribal Fish Commission
National Audubon Society
American Bird Conservancy

Oregon
- Department of Environmental Quality
- Department of Fish and Wildlife
- Department of Land Conservation and Development
- Division of State Lands
- Oregon State University
- Clatsop County

Washington
- Department of Ecology
- Department of Fish and Wildlife
- Department of Natural Resources
- City of Chinook
- Sea Resources

Comments were received from 24 Federal and State agencies, organizations and interested parties. In addition, comments were received from students at Ilwaco High School and Portland Community College, where response to this EA was an assignment of an Environmental Studies class. A list of commentors can be found preceding the comment letters included at the end of this EA. Several comment themes were identified. Comments have been summarized and responded to below. Comments ranged from full support of the original proposed action to opposition to any interference with the tern colony. In addition to comments on the EA, Idaho Steelhead and Salmon Unlimited et al., on November 25, 1998, issued a 60-day notice of intent to file suit under the Endangered Species Act because the Corps has not meaningfully addressed the problem of piscivorous birds preying on juvenile anadromous fish in the Columbia River environs.

During the review period, the CTWG held a meeting with three national bird conservation groups on November 17, 1998, to discuss possible impacts of the proposed action and attempt to arrive at a modified action. Comment letters from these conservation groups reflect and restate their concerns and position on the action as proposed in the draft EA. A tentative agreement that the Corps would not seed all 8 acres of the existing colony habitat on Rice Island was made. The conservation groups requested 2 acres undisturbed and another 2 acres unseeded

but with plastic fencing. The groups requested numerous changes in harassment techniques as described in the draft EA and in activities at East Sand Island. Further consideration of this proposal by the Corps, USFWS and the NMFS resulted in the present proposed action: that 1 acre of the Rice Island colony site would remain unseeded. The remainder of the unvegetated portion of Rice Island is proposed for seeding (199 acres), and activities to discourage nesting are limited to human disturbance only.

Comments and Responses

Comments have been summarized. Several themes were identified, i.e., several commentors made the same kind of comment.

Theme Comments

1. This proposal requires preparation of an EIS; the EA is inadequate since it doesn't contain the requirements of an EIS.

a. Requirements for EIS vs. EA. An EIS is required on a major Federal action having a significant impact on the total human environment. The Corps does not consider the proposed action a major action. It is a pilot study, containing elements of dredged material management. Studies that do not contain recommendations for authorization or funding for construction are categorically excluded under Corps guidelines (ER 200-2-2). Management, including erosion control from wind by seeding, is a normal part of dredged disposal activities which has been covered in previous EIS's and EA's. The actions proposed, dredged material disposal site management and human disturbance of birds prior to nesting, are minor in terms of acreage affected and commitment of resources, and are not irreversible or irretrievable.

CEQ Regulations for implementing NEPA (1501.3) state that agencies may prepare an environmental assessment on any action at any time to assist agency planning and decisionmaking. Section 1501.4 gives guidance on "Whether to prepare an environmental impact statement." Based on this guidance, an environmental assessment (EA) is the appropriate document. An EA generally has one of three outcomes: 1) a Finding of No Significant Impact (FONSI); 2) a decision to prepare an EIS; or 3) a decision to forego, delay or revise the project. The specific action--to manage dredged material disposal sites--is not one that normally requires an EA. The proposed action is a proposal to study, and as such is a requirement of the NMFS' 1995 Biological Opinion (XII. Incidental Take Statement, item 9. The Corps shall conduct studies to identify (a) Caspian tern predation of juvenile salmonids, and (b) methods to discourage tern nesting.). Complying with ESA also does not normally require an EA. The need for the action--to reduce bird predation on salmonids by relocating a Caspian tern colony and gather information from that action--is an outgrowth of the Biological Opinion.

The decision to prepare the EA was based on the need to determine if the action was expected to have a significant impact, not on the extent of the action.

Since the document prepared is an EA, not an EIS, it is by definition “concise” and “briefly provide[s] sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact” (1508.09 (a)(1). The standards which several commentors claimed the EA violated are ones applicable to a full EIS, not an EA. The Corps believes the EA, especially after incorporating review comments, is adequate for determining a finding of no significant impact.

b. The EA fails to adequately consider alternatives. The commentors have confused requirements of an EIS, in which the alternatives section “is the heart of the environmental impact statement,” with the “concise” and “brief” requirements of an EA. One function of the EA is to help the agency identify better alternatives and mitigation measures. Alternatives to the proposed action are to be described in any proposal that involves unresolved conflicts regarding alternative uses of resources (NEPA, Section 102 (E)). At the draft level of the EA, the proposed action itself contained alternatives in the form of phased action--thus the proposed action was in actuality three alternatives--plus the alternative of No Action. Whether there are unresolved conflicts is a matter of professional opinion; however, the proposed action is a pilot study which would identify possible conflicts which could be resolved in the future. Some alternatives suggested by commentors, such as revising hatchery management, are outside the scope of the document. Review of the draft EA has resulted in a revised proposed action which should reduce the potential for conflict of resource uses.

2. The proposal has a significant impact on Caspian Terns.

Since the proposal is a study, the extent of impacts is unknown until data have been gathered and analyzed. However, significant impacts are not expected for several reasons. The proposed habitat modification is not irreversible. Seeding of Rice Island and Miller Sands Spit could be reversed by tillage, returning the areas to open sand. Disturbance of terns attempting to nest on Rice Island, if successful, could prevent 1 year’s production assuming, in a worst case, that there was no successful nesting at East Sand Island, Rice Island, or elsewhere. With birds as long-lived as the Caspian tern, 1 or 2 years of unsuccessful nesting for this colony is not considered significant. In 1997, the colony on Rice Island fledged only 400 young, yet in 1998, the colony increased in size and more than 4,000 were fledged. If the relocation attempt fails, Rice Island could be returned to preferred nesting habitat for future nesting.

Caspian terns in the West Coast population are reported to live up to 27 years, over half of the fledglings reach their fourth year and they have a breeding life expectancy of nearly 9 years (Gill and Mewaldht, 1983). Caspian terns do not exhibit a high degree of fidelity to their natal colonies and exchange freely between nesting colonies. En masse colony relocations of up to 800 km have been reported in Europe. En masse relocation of Caspian tern colonies in the Pacific Coast population has happened at least 7 times in the past 30 years. (Roby, EA comment letter). In spite of relocations, the West Coast population has increased approximately 4-fold from 3,500 pairs in the 1960's to 14,000 pairs in the 1990's. Although the 10,000 pairs on Rice Island currently represent close to 75 percent of the West Coast population, the number of birds nesting elsewhere on the West Coast is as large as reported in the 1960's.

The Rice Island tern colony is part of a general trend for Pacific coast Caspian terns of: (1) shifting breeding colonies from inland, natural sites to coastal, anthropogenic sites, (2) shifting from nesting in small groups within larger colonies of gulls to nesting in large, single species colonies, (3) dramatic overall population increase, and (4) rapid northward range expansion.

Loss of a year’s chick production would have an impact. However, since they are a long-lived bird that will nest multiple times, the loss would not be a significant impact. Based on the above observations, it is not likely that the pilot project proposed for 1999 will cause long-term harm to the West Coast Caspian tern population. In addition, under the revised action, 1 acre of tern habitat would be left at Rice Island. This will serve as a safety valve in the event the terns do not relocate.

The large Caspian tern colony on Rice Island is reported to have atypical behavior and very poor reproductive success compared to normal-sized colonies of a few hundred pairs. There is reason to believe that dispersing the colony will be beneficial to birds as well as to fish.

Caspian terns are distributed throughout the northern hemisphere, coastal Africa and Madagascar. A separate subspecies occurs in Australia and New Zealand. As such they are perhaps the most common and widely distributed of the tern species.

3. Impacts to Sea Resources were understated.

Sea Resources was identified by the Corps as an interested public and is a member of the CTWG. The working group is aware of Sea Resources’ concerns about the relocation of Caspian terns. Sea Resources operates a facility aimed mostly at teaching and demonstrations for the students from the high school at Ilwaco on aquaculture, stream hydrology, and fishery biology. They rear coho, chum and fall chinook and supplement Chinook River runs.

They are also involved with habitat improvement on the river. The commercial hatchery operation ceased several years ago. Most of the present hatchery releases occur outside of the tern nesting season. Releases of chinook during April and June would be available to predatory birds, including cormorants presently nesting on East Sand Island, and the Caspian terns if relocation is successful.

They are working with WDFW to be part of the chum recovery operation for the Lower Columbia ESU, which sounds like an excellent use of their facility and energy plus a very positive teaching opportunity. The fall chinook program is also small, probably originated from Willapa Bay fish that might need to be phased out if lower river chinook are listed.

They also have a problem with a tide gate at the highway crossing near the mouth of the Chinook River. The tidegate limits saltwater intrusion, so the tidewater area has become home to bass and bluegills that prey on small releases. To minimize potential increased impacts to this program, the Corps can work with Sea Resources to develop opportunities for funding to replace the tidegate, and alternative release methodologies to decrease predation on outmigrants.

Due to the timing of Caspian tern nesting, only those chinook released between April and June are likely to be subject to predation from terns nesting at East Sand Island. While these hatchery-raised chinook are important to the school, they are not ESA stocks. The low survival rate of Sea Resources releases indicates other factors, such as the tidewater area problem, are at work here. Improvement to the tidegate could mitigate additional losses from relocated terns. The WDFW and NMFS will continue to coordinate with Sea Resources to minimize impacts to and improve their hatchery program.

4. Deal with overall issues before disturbing terns.

NMFS has made the determination that Caspian tern predation on juvenile salmonids in the Columbia River estuary is a significant problem and has directed the Corps of Engineers to address tern predation. A multi-million dollar program is already underway that addresses dam passage, hatcheries, habitat, harvest, etc.. These programs and expenditures are based upon the assumption that more juveniles entering the Pacific Ocean will result in increased adult returns to the Columbia River system. Decisions on overall issues could be made within the next year or so. Information from this pilot study will provide more data which may be useful in the overall decisions.

5. Hatchery fish are not ESA fish.

While Caspian terns are taking a disproportionate number of hatchery fish, they are also harvesting wild fish. NMFS

estimates, using the average number of juvenile salmonids taken by terns for 1997 (15 to 16 million) and an estimated percentage of listed stocks in that total, that about 250,000 fish of listed stocks were taken in 1997 by Caspian terns. Further, NMFS estimates that 1,600,000 listed fish could be taken in 1999 by Caspian terns; this reflects in part a greater number of listed stocks in 1999 for the Columbia River basin. Many wild stocks have been incorporated into the hatchery program to facilitate Columbia River salmonid recovery efforts. Upper Columbia River steelhead, Snake River sockeye, many Snake River spring-summer chinook and some Snake River fall chinook originate from hatcheries. These stocks are ESA listed. Some lower Columbia River summer and winter steelhead (Kalama, Sandy and Clackamas River) originate from hatcheries and are ESA listed. Cowlitz River reintroductions of winter steelhead and spring chinook are ESA listed. Hatchery chums (Grays and Elochoman River) are also ESA proposed stocks. Hatchery fish remain an important component of Columbia River salmonid recovery efforts.

6. Do more research before taking action.

The proposed activity is a continuation of the past 2 years of research. Caspian tern management actions were delayed in 1998 to allow for a second year of research and data collection to ensure that 1997 results were not anomalous. No management prescriptions to move or harass terns occurred during those two years of research. We are unsure that without this action, further research of the Caspian tern colony at Rice Island will provide any additional information. Many of the questions received are being addressed in the proposed research activities that are part of the relocation effort.

7. Define study goals or success.

The primary goal of the relocation study is to evaluate whether relocation of the tern colony will reduce impacts to listed salmonid species while minimizing impacts to Caspian terns. The pilot study will test if the colony can be relocated, if their diet will change with a change in nesting location, and if the juvenile salmonid component of their diet will change with a change in nesting location, all while minimizing the impact on the tern population. Comparison of 1999 research results with information from the previous 2 years will provide an indication of success.

8. Caspian terns are a species of concern elsewhere.

The activity proposed is not anticipated to have a significant impact on Caspian terns. The proposed action is not irreversible or irretrievable; nesting habitat can be restored at Rice Island quickly. One acre of nesting habitat will be left on Rice Island with implementation of the pilot study. Reproductive success at Rice Island has been low (1997, 5 percent and 1998, 38 percent),

which may be indicative of an abnormally large colony size relative to others worldwide. A number of comments to the EA addressed the unusually large size of the colony and the potential for disease, natural disaster events, or adverse human actions, which could impact a large segment of the North American Caspian tern population. Long-term actions, to disperse the population, thereby lessening potential population loss to singular disasters, will be addressed in forthcoming meetings of the Caspian Tern Working Group.

Other Comments:

Assumption that terns relocated to East Sand Island will not forage at Rice Island is not valid. Answer is contingent upon research results.

Shift in diet composition will not occur with shift to East Sand Island. Answer is contingent upon research results.

Need to discuss impacts to cormorants, gulls, shorebirds and brown pelicans. Biological Assessment addressed brown pelicans. The Corps will consider provisions of MBTA.

Unrealistic to move the entire colony. Pilot study will leave 1 acre of nesting habitat. It is estimated that 1 acre of habitat will support approximately 1,000-plus pairs of Caspian terns.

Provide data on adult returns. NMFS has return data on Snake River salmonids. No research exists that relates adult returns to Caspian tern predation on juvenile salmonids. NMFS tells us that there is a relationship between the number of juvenile salmonids that reach the Pacific Ocean and adult returns; basically that the more juveniles that reach the ocean the more adults that will return. We defer to NMFS's professional judgement.

CONSULTATION REQUIREMENTS

a. Clean Water Act of 1977: Section 404 of the Clean Water Act will be complied with. No fill in waters of the U.S. is proposed.

b. Coastal Zone Management Act: The proposed action is within the Columbia River estuary. East Sand Island, Rice Island and Miller Sands Spit are designated Conservation shorelands in the Clatsop County Comprehensive Plan. Lands with this designation are to be managed for protection and maintenance of water quality, fish and wildlife habitat, water-dependent uses, economic resources, esthetic values and recreation. East Sand Island has two areas designated Priority 1 for dredged material disposal. Disposal site CC-S-6.8, on the upstream end of East Sand Island, is noted in the 1986 Dredged Material Management Plan prepared by CREST as having a nesting colony of Caspian terns and prefers this site not be revegated after disposal activities. All of Rice Island is designated Priority 1 for disposal. The northeast corner of Rice Island is within the State of Washington, and Rice Island also contains a disposal location designation for Wahkiakum County, Washington. No actions are proposed for the Washington portion of Rice Island. All of Miller Sands Spit is designated Priority 1 for disposal. A Coastal Zone Consistency Determination was submitted to the Oregon Department of Land Conservation and Development (DLCD) for

review concurrent with this EA. DLCD concurred with the Consistency Statement in correspondence dated December 15, 1998.

c. Endangered Species Act of 1973, as amended: Listed or proposed threatened or endangered species are not likely to be adversely affected (brown pelican, bald eagle, peregrine falcon) or are not affected (western snowy plover, Oregon silverspot butterfly, Howellia) by the proposed actions. The threatened bald eagle nests and winters in the vicinity of East Sand Island, Rice Island and Miller Sands Spit. The brown pelican is a summer resident in and around East Sand Island. Western snowy plovers, Oregon silverspot butterfly and Howellia do not occur in the project area. A biological assessment (BA) has been prepared, with a finding of not likely to adversely affect or no effect for listed species in the project vicinity, and submitted to USFWS for concurrence. The USFWS concurred (December 11,1998) with the Corps findings, adding recommendations to further conserve the brown pelican. The Corps has agreed to the recommendations.

Listed species of salmonids are expected to benefit from the proposed action, and the Corps prepared a BA to that effect. The Corps and the NMFS are consulting regarding the pilot study and ESA-listed salmonids. During this consultation, the Corps has made a Section 7(d) determination. This determination finds that implementation of the action described in the BA is consistent with the provisions of Section 7(d) of the ESA. The Corps has submitted the determination to NMFS and they have provided their concurrence, dated January 14, 1999.

d. Fish and Wildlife Coordination Act: The proposed action is in compliance with the requirements of this act.

e. Migratory Bird Treaty Act of 1918, as amended. This act prohibits the taking of migratory birds except as permitted through certain regulations. These regulations (50 CFR 21) authorize the taking of migratory birds through establishment of hunting seasons and issuance of various permits. Permits may be issued for “depredation control purposes,” including reducing damage to public property. Permits may be issued to wildlife management authorities for the purpose of protecting State and Federal listed plants or animals, or species of management concern from predation or competition at levels documented to jeopardize the recovery of stability of such species. Permits are not required to scare or herd depredating migratory birds, unless such hazing results in the abandonment of active nests, or the loss of eggs, nestlings or adults. The “take” prohibitions of the MBTA do not apply to the activities of Federal agencies.

The United States Government continues to be bound by the international agreements (four bilateral Migratory Bird Conventions) to protect migratory birds. The USFWS continues to informally consult with other Federal agencies, to ensure those agencies conduct Federal actions in a manner that complies with

the obligations of the Government under the various Migratory Bird Conventions.

e. Marine Protection, Research, and Sanctuaries Act of 1972, as amended: No marine resources covered under this Act would be affected by the proposed action.

f. Cultural Resources Acts: No cultural resources would be affected by activity at this location due to the extent of past disturbance. Historical resources (remnants of WW II military action) on East Sand Island located in the project area have been buried under dredged material and would be unaffected by removal of vegetation and surface soil. The Oregon State Historic Preservation Office has been advised of activity in the area.

g. Executive Order 11988, Flood Plain Management, 24 May 1977: No flood plains would be affected by the proposed action.

h. Executive Order 11990, Protection of Wetlands: No wetlands would be affected by the proposed action.

i. Analysis of Impacts on Prime and Unique Farmlands: Not applicable.

j. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Resource conservation and Recovery Act (RCRA). No hazardous, toxic and radioactive waste (HTRW)concerns have been identified.

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Roby, Daniel D. and David P. Craig (Oregon State University); Collis, Ken and Stephanie L. Adamany (Columbia River Inter-Tribal Fish Commission). 1998. Avian Predation on Juvenile Salmonids in the Lower Columbia River. 1997 Annual Report. Corvallis and Portland, Oreg. September 1998.

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Comments Received on Draft Caspian Tern EA

U.S. Fish and Wildlife Service, Portland, OR
National Marine Fisheries Service, Portland, OR
Columbia River Inter-Tribal Fish Commission, Portland, OR
Oregon Dept of Fish and Wildlife, Portland, OR
Washington Department of Fish and Wildlife, Olympia, WA
American Bird Conservancy, Wash. DC
Sea Resources, Chinook, WA
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Brian Gershon, East Lake Washington Audubon Society, Bellvue, WA
Greg & Tammy Pelletier, Olympia, WA
Pacific County Commissioners, South Bend, WA
Ellen Paul, The Ornithological Council, Wash., DC
Paul Ketcham, Audubon Society of Portland, Portland, OR
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Scott Richardson, Black Hills Audubon Society, Olympia, WA
Ruth Deery, Willapa Hills Audubon Society, Longview, WA
Gary Ivey, Wildlife Society, Oregon Chapter, Corvallis, OR
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Steve Kress and Paul Englemeyer, National Audubon Society, NYC, NY
Mark Doumit, State Representative, Olympia, WA
Scott M. Hansen, Roy, WA
Oregon DLCD, Salem, OR
Sid Snyder, Washington State Senator, Olympia, WA

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